

WHAT IS CLAIMED IS:

1. A method for controlling a cooling fan unit of a vehicle, the cooling fan unit including at least one cooling fan, the method comprising:

detecting a plurality of vehicle parameters including a coolant temperature and a vehicle speed;

determining a driving load of the cooling fan unit corresponding to the vehicle parameters on the basis of a plurality of temperature ranges of the coolant temperature and a plurality of speed ranges of the vehicle speed, the driving load being selectively determined from a plurality of predetermined loads; and

operating the cooling fan unit at the determined driving load.

2. The method of claim 1, wherein:

the plurality of temperature ranges are formed by at least one reference temperature selected from a plurality of predetermined temperatures; and

the plurality of speed ranges are formed by at least one reference speed selected from a plurality of predetermined speeds.

3. The method of claim 2, wherein:

the vehicle is equipped with an air conditioning system including an air/con switch; and

the at least one reference temperature and the at least one reference speed are selected on the basis of an on/off state of the air/con switch.

4. The method of claim 3, wherein the at least one reference temperature and the at least one reference speed are selected on the basis of an on/off state of the air/con switch and a refrigerant pressure in the air conditioning system.

5. The method of claim 3, wherein, in the case in which the air/con switch is off, the determining the driving load of the cooling fan unit determines the driving load as:

a smallest one of the predetermined loads when the coolant temperature lies in a first temperature range less than a first reference temperature;

a load depending on comparison of the vehicle speed and a first reference speed when the coolant temperature lies in a second temperature range greater than or equal to the first reference temperature and less than a second reference temperature;

a load depending on comparison of the vehicle speed and a second reference speed when the coolant temperature lies in a third temperature range greater than or equal to the second reference temperature and less than a third reference temperature; and

a largest one of the predetermined loads when the coolant temperature lies in a fourth temperature range greater than or equal to the third reference temperature.

6. The method of claim 5, wherein:
the first reference temperature is less than 100°C; and
the second reference temperature and the third reference temperature are greater than 100°C.

7. The method of claim 5, wherein the first reference speed is smaller than the second reference speed.

8. The method of claim 4, wherein, in the case in which the air/con switch is on and the refrigerant pressure lies in a range less than a first predetermined pressure and greater than or equal to a second predetermined pressure, the determining the driving load of the cooling fan unit determines the driving load as:

a smallest one of the predetermined loads when the coolant temperature lies in a first temperature range less than a first reference temperature;

a load depending on comparison of the vehicle speed and a first reference speed when the coolant temperature lies in a second temperature range greater than or equal to the first reference temperature and less than a second reference temperature;

a load depending on comparison of the vehicle speed and a second reference speed when the coolant temperature lies in a third temperature range greater than or equal to the second reference temperature and less than a third reference temperature; and

a largest one of the predetermined loads when the coolant temperature lies in a fourth temperature range greater than or equal to the third reference temperature.

9. The method of claim 8, wherein:
the first reference temperature is less than 0°C;
the second reference temperature is greater than or equal to 0°C and less than
100°C; and
5 the third reference temperature is greater than 100°C.

10. The method of claim 8, wherein the first reference speed is greater
than the second reference speed.

11. The method of claim 4, wherein, in the case in which the air/con switch
is on and the refrigerant pressure is less than a predetermined pressure, the determining
10 the driving load of the cooling fan unit determines the driving load as:

a smallest one of the predetermined loads when the coolant temperature lies in a
first temperature range less than a first reference temperature;

a load depending on comparison of the vehicle speed and a first reference speed
when the coolant temperature lies in a second temperature range greater than or equal to
15 the first reference temperature and less than a second reference temperature; and

a largest one of the predetermined loads when the coolant temperature lies in a
third temperature range greater than or equal to the second reference temperature.

12. The method of claim 11, wherein:
the first reference temperature is less than 0°C; and
20 the second reference temperature is greater than 100°C.

13. The method of claim 4, wherein, in the case in which the air/con switch
is on and the refrigerant pressure is greater than or equal to a predetermined pressure,
the determining the driving load of the cooling fan unit determines the driving load as:

a smallest one of the predetermined loads when the coolant temperature is less
25 than a first reference temperature; and

a largest one of the predetermined loads when the coolant temperature is greater
than or equal to the first reference temperature.

14. The method of claim 13, wherein the reference temperature is less
than 0°C.

15. The method of claim 2, wherein the at least one reference temperature and the at least one reference speed are selected on the basis of whether the vehicle is equipped with an air conditioning system.

16. The method of claim 15, wherein, in the case in which the vehicle is not equipped with an air conditioning system, the determining the driving load of the cooling fan unit determines the driving load as:

a smallest one of the predetermined loads when the coolant temperature lies in a first temperature range less than a first reference temperature;

a load depending on comparison of the vehicle speed and a first reference speed when the coolant temperature lies in a second temperature range greater than or equal to the first reference temperature and less than a second reference temperature; and

a largest one of the predetermined loads when the coolant temperature lies in a third temperature range greater than or equal to the second reference temperature.

17. The method of claim 2, further comprising determining whether a detected vehicle parameter is abnormal,

wherein the determining the driving load of the cooling fan unit determines the driving load on the basis of whether a vehicle parameter is abnormal and which vehicle parameter is abnormal.

18. The method of claim 17, wherein, in the case in which the vehicle speed is abnormal, the determining the driving load of the cooling fan unit determines the driving load using a value less than the first predetermined speed as the vehicle speed.

19. The method of claim 17, wherein, in the case in which the coolant temperature is abnormal, the determining the driving load of the cooling fan unit determines the driving load as the largest one of the predetermined loads.

20. The method of claim 17, wherein the vehicle is equipped with an air conditioning system including an air/con switch and the vehicle parameter further comprises a refrigerant pressure of the air conditioning system,

wherein, in the case in which the refrigerant pressure is abnormal, the

determining the driving load of the cooling fan unit determines the driving load as:

a smallest one of the predetermined loads when the coolant temperature lies in a first temperature range less than a first reference temperature;

a load depending on comparison of the vehicle speed and a first reference speed when the coolant temperature lies in a second temperature range greater than or equal to the first reference temperature and less than a second reference temperature;

a load depending on comparison of the vehicle speed and a second reference speed when the coolant temperature lies in a third temperature range greater than or equal to the second reference temperature and less than a third reference temperature; and

a largest one of the predetermined loads when the coolant temperature lies in a fourth temperature range greater than or equal to the third reference temperature.

21. An apparatus for controlling a cooling fan unit of a vehicle, the cooling fan unit including at least one cooling fan, the apparatus comprising:

a coolant temperature detector for detecting a coolant temperature;

a vehicle speed detector for detecting a vehicle speed; and

a controller for controlling the cooling fan unit at least on the basis of the coolant temperature and the vehicle speed,

wherein the controller executes instructions for a method comprising:

detecting a plurality of vehicle parameters including a coolant temperature and a vehicle speed;

determining a driving load of the cooling fan unit corresponding to the vehicle parameters on the basis of a plurality of temperature ranges of the coolant temperature and a plurality of speed ranges of the vehicle speed, the driving load being selectively determined from a plurality of predetermined loads; and

operating the cooling fan unit by the determined driving load.